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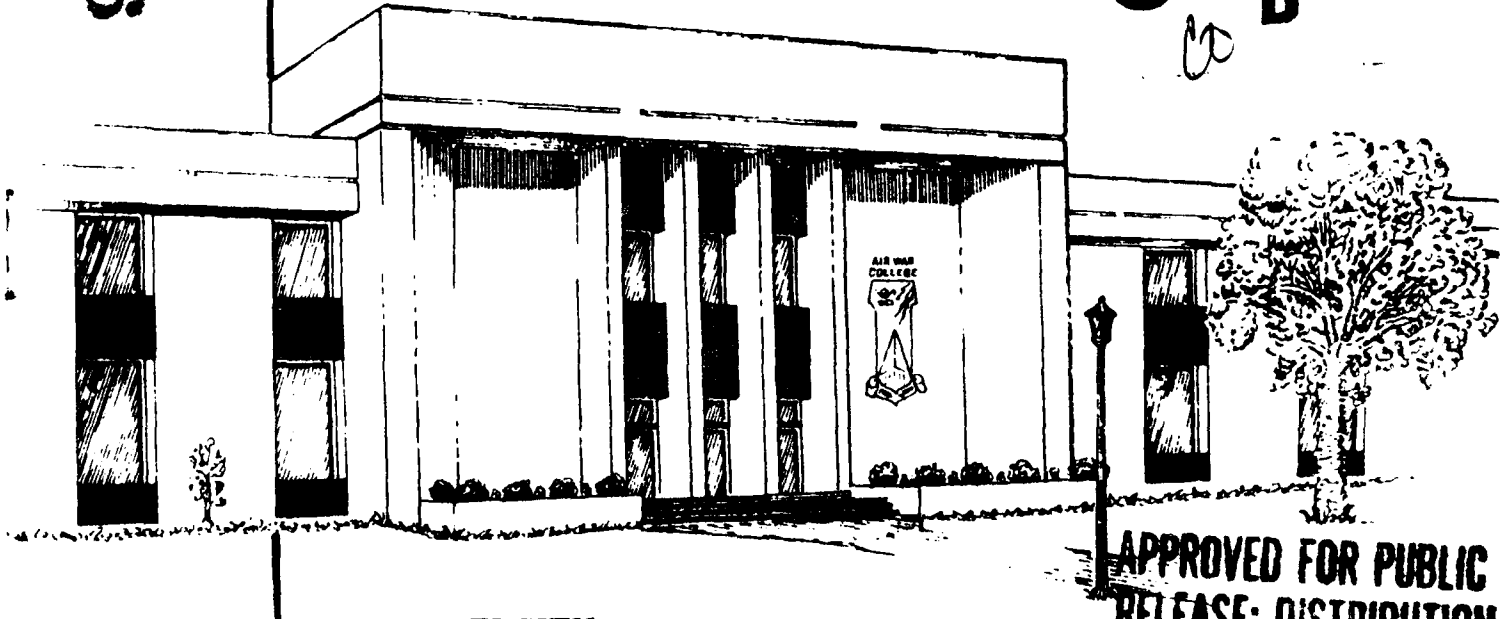
AIR WAR COLLEGE

RESEARCH REPORT

THE FUTURE OF THE AIR FORCE NAVIGATOR

LIEUTENANT COLONEL LARRY D. MAGNUSON

1989



AIR UNIVERSITY
UNITED STATES AIR FORCE
MAXWELL AIR FORCE BASE, ALABAMA

AIR WAR COLLEGE
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THE FUTURE OF THE AIR FORCE NAVIGATOR

by

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Lieutenant Colonel, USAF

A DEFENSE ANAYLTICAL STUDY SUBMITTED TO THE FACULTY

IN

FULFILLMENT OF THE CURRICULUM

REQUIREMENT

Advisor: Colonel Jerry Lopez

MAXWELL AIR FORCE BASE, ALABAMA

May 1989

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EXECUTIVE SUMMARY

TITLE: The Future of the Air Force Navigator

AUTHOR: Larry D. Magnuson, Lieutenant Colonel, USAF

Remarks on the historical, current, and primarily the future role of the United States Air Force Navigator. Special emphasis is made on the future opportunities in four areas: operational, staff, command, and promotion. Operational areas deal with the decreased need for navigators in modern aircraft where computerized systems have replaced the need for a "celestial" navigator. Staff areas deals with both the rated staff and the rated supplement. With the current pilot shortage, more of these staff positions may open up and with them the increased opportunity to excel. Command opportunities are highlighted with the reality that although operational command positions continue to be exploited by navigators, they should prepare themselves, through the rated supplement, for highly demanding support command positions. Promotions at the senior officer levels are explored in that there appears to be a direct relationship with staff and command experience. Conclusions are made on the future of the Air Force navigator based on significant decisions currently being discussed on the restructuring of staff and rated supplement opportunities for all officer crewmembers.

BIOGRAPHICAL SKETCH

Lieutenant Colonel Larry D. Magnuson is a Master Navigator with over 3,000 hours of flying in C-130's, WC-130's, and HC-130's. A Vietnam veteran, Colonel Magnuson has had assignments in the Tactical Air Command and the Military Airlift Command to various locations: Langley AFB, Virginia; McChord AFB, Washington; Andersen AFB, Guam; and Scott AFB, Illinois. HQ MAC staff positions include Operations Plans, and as Division Chief of the Executive Development Division of Personnel. He has also served as Commander of the 1550 Technical Training Squadron at Kirtland AFB, New Mexico. His squadron received the 1987 Outstanding Rescue/Weather Reconniassance Squadron award from HQ MAC, and Colonel Magnuson was honored as an honorary Pararescueman by the USAF Pararescue School. Colonel Magnuson completed Squadron Officers School and the National Security Management Course by correspondence and completed Air Command and Staff College and Air War College by Seminar. He is also a distinguished graduate of Squadron Officers School, and has completed Armed Forces Staff College and Air War College in residence.

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CHAPTER I

INTRODUCTION

> 10 SEPTEMBER 2050. "GOOD MORNING AIR FORCE CADETS, and welcome to Aircraft History 101. Today we'll discuss that twentieth century phenomenon, the Air Force navigator. It may be hard to imagine now, but a few decades ago we actually had navigators on board our aircraft that used to keep track of the aircraft by use of hand held slide rulers, bulky celestial tables, and celestial sighting devices called a sextant."

The above conversation dramatizes the question that many Air Force navigators must deal with--namely is there a future for the navigator? If there is a future, in what aircraft systems does it lie? What are the future propects for staff and command opportunities? How long until the inertial and satellite based navigational systems delete the requirement for the navigator? Should I be looking to cross train into another career field or should I stay in the Air Force at all? These are questions that deserve an honest and timely answer.

The purpose of this study is to, therefore, analyze current opportunities for navigators and then project future roles of the navigator in terms of challenging career opportunities. These current opportunities will cover four areas: operational opportunities, staff opportunities, command opportunities, and promotion opportunities. By the end of this report, the reader will have a much broader

knowledge base to answer the questions posed earlier and determine if he agrees or disagrees with the conclusions and proposals. Before beginning, a basic definition of navigator is necessary.

Definition

Throughout this paper references to "navigators" refers to all officers, through lieutenant colonel, wearing navigator wings. This includes navigators, weapon system officers (WSO), electronic warfare officers (EWO), fire control officers (FCO), offensive systems operators (OSO), defensive systems operators (DSO), and radar navigators (RN). Where appropriate, EWO's will be broken out separately.

However, before looking into the future, a review of the history of navigation is in order.

CHAPTER II

HISTORY

Aircraft navigation began as earlier as 1909. The honor of the first aircraft navigator may well go to Lt. Benjamin Foulois. In 1909 the Army laid down specific requirements for an aircraft. They said it must stay aloft for an hour and fly a set course at a speed of at least forty miles an hour. The Wright brothers had satisfied the one hour endurance requirement by flying in circles over the field, but the speed trial required a straight line flight of five miles. Lt. Foulois laid out the course from the Army post at Fort Myer, Virginia, to Shooter's Hill in Alexandria. He had a balloon raised at the hill and another about midway on the course. Lt. Foulois made his first flight as the observer/navigator that day and opened the door to global aircraft navigation.

Since that time navigation has progressed dramatically. Initially, pilots drew their own aerial maps. Railroad tracks were used as good ground references and farmers even began putting arrows on their barns pointing to the nearest town. Notable advances in technology occurred in 1911 with the gyrocompass. By 1913 gyrocompass's were being tied to automatic pilot systems and in 1914 pilots began taking radios aloft to talk to ground stations. In the 1920's

electric arc beacons were provided with radio directional beacons. In the mid-1930's, Major Ira Eaker flew coast-to-coast "blind" by using only his radio and cockpit instruments to navigate. (7:70-71)

Navigation has become a full time job with a navigator as an integral part of the crew. Since World War II advances have exploded: Radar, Long Range Navigation (LORAN), Omega, Inertial Navigation Systems (INS), and the soon to be operational space based Global Positioning System (GPS) have all enhanced navigation. These systems have relegated the time honored art of long distance navigation extant with the dependable yet dated vacuum tube. That is not to say the celestial navigator is gone. The C-130 navigator still gets a chance for an occasional three star fix, but true basic navigation over the Atlantic and Pacific Ocean is rapidly disappearing. However, the future opportunities for navigators is expanding as the mission moves away from the long routine navigational legs to high speed, low level flying. The navigator is now a synergistic partner with the pilot in systems interpretation and analysis of the combat environment.

Since the operational opportunity is the primary challenge encountered initially by the navigator it will be dealt with first.

CHAPTER III

OPERATIONAL OPPORTUNITIES

Inclusive Navigator Requirements

There will continue to be a requirement for navigators for the current generation of aircraft. However, there is a questionable need for navigators for the next generation of aircraft. In support of this observation, this section covers current generation aircraft navigator requirements. These requirements are as projected by training quotas at Specialized Undergraduate Navigator Training (SUNT) and Air Staff force projections. Navigator requirements for the next generation aircraft are then explored. These navigator requirements are then broken down by fighters, bombers, tankers, and airlift (strategic and tactical).

The first question to answer is: what are the stated requirements for navigators versus inventory?

General Navigator Requirements versus Inventory

The traditional "celestial" navigator with his sextant, star tables, and desk is being replaced with aircraft computer systems. The inertial navigation system, and the space based multi-satellite system of the Global Positioning System will improve positioning accuracy measured in meters not miles. With this traditional role being deleted, the

navigator's role is shifting toward an increased presence in fighter aircraft, and a decreased need in bombers, tankers, strategic and tactical airlift.

First, across the board, the number of navigators required will be decreasing for the next several years. According to the 1989 Rated Management Document (RMD) by HQ USAF/XOOTW, the requirement for navigators will drop four percent from 9263 in FY 88 to 8856 in FY 93. However, the inventory of navigators will drop even more, resulting in a net shortage by FY 93. (31:0-2)

NAVIGATOR PROJECTION FY 88-93

FY	88	89	90	91	92	93
Requirements	9263	9164	8942	8860	8838	8856
Inventory	9945	9778	9563	9313	9039	8786
Delta	+682	+614	+621	+453	+201	-70

Figure 3-1 (See Also Chart 3-1)

The requirements projection in figure 3-1 include force, training, advance student, staff, as well as rated supplement, Professional Military Education (PME), and other areas. In this next section FORCE requirements will be analyzed since they are the numbers required for operational duties. These force requirements are divided into five separate areas: fighter, bomber, tanker, strategic airlift, and tactical airlift. Although total requirements in figure 3-1 were for FY 88-FY 93, the RMD broke down specific requirements based on FY 89-FY 94. An analysis of these

NAVIGATOR PROJECTION
FY 88 - FY 93

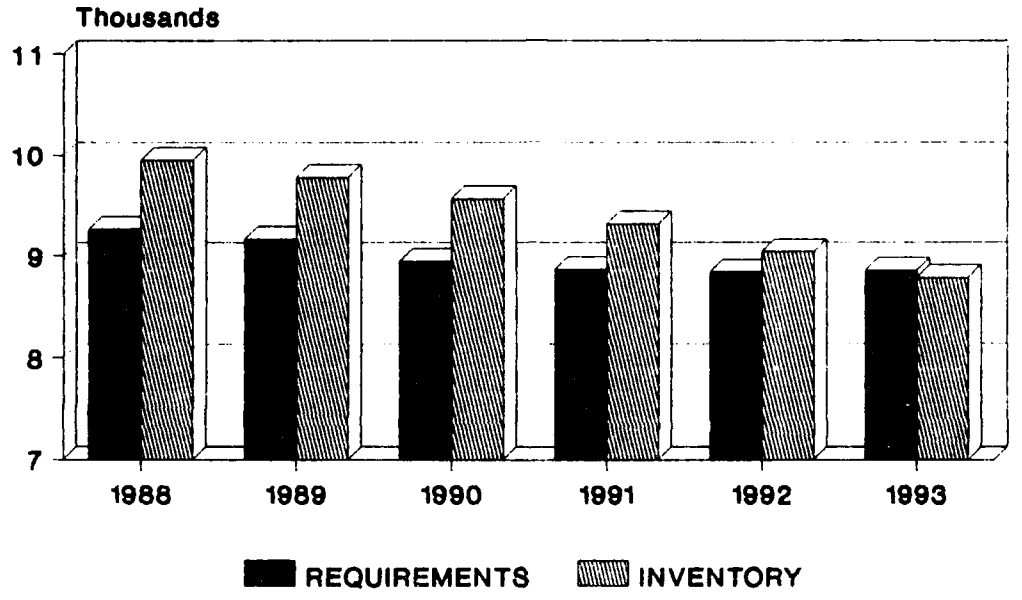

CHART 3-1

figures are presented in the next section.

Force Requirements

Overall, there will be over a four percent decrease in navigator "force" requirements for the current generation aircraft by FY 93. Interestingly, the fighters (FTR) and tactical airlift (TAL) show an increase in requirements. Strategic airlift (SAL) remains about the same. The tankers (TANK) show a slight decrease, whereas bombers (BMB) project a dramatic decrease in navigator requirements, more than offsetting increased fighter requirements. Bombers are projecting an 18 percent decrease (190 positions) in only six years. (31:3-7, 3-9)

NAVIGATOR FORCE REQUIREMENTS FROM FY 89 TO FY 94

AIRCRAFT	FTR	BMB	TANK	SAL	TAL	OTHER	TOTAL
FY 89	636	1078	951	158	678	13	3514
FY 94	654	888	940	162	703	13	3360
DELTA	+18	-190	-11	+4	+25	0	-154

Figure 3-2 (See Also Chart 3-2)

These projections are subject to significant changes as decisions are made concerning the timing and costs of installing state of the art navigational systems and replacing navigators. However, it appears that the opportunities seem to be expanding in the fighter world.

Force Requirements for Todays Fighters

Fighter type aircraft will provide an increasing need for navigators with its current generation of aircraft. In

NAVIGATOR FORCE REQUIREMENTS
FY 89 TO FY 94

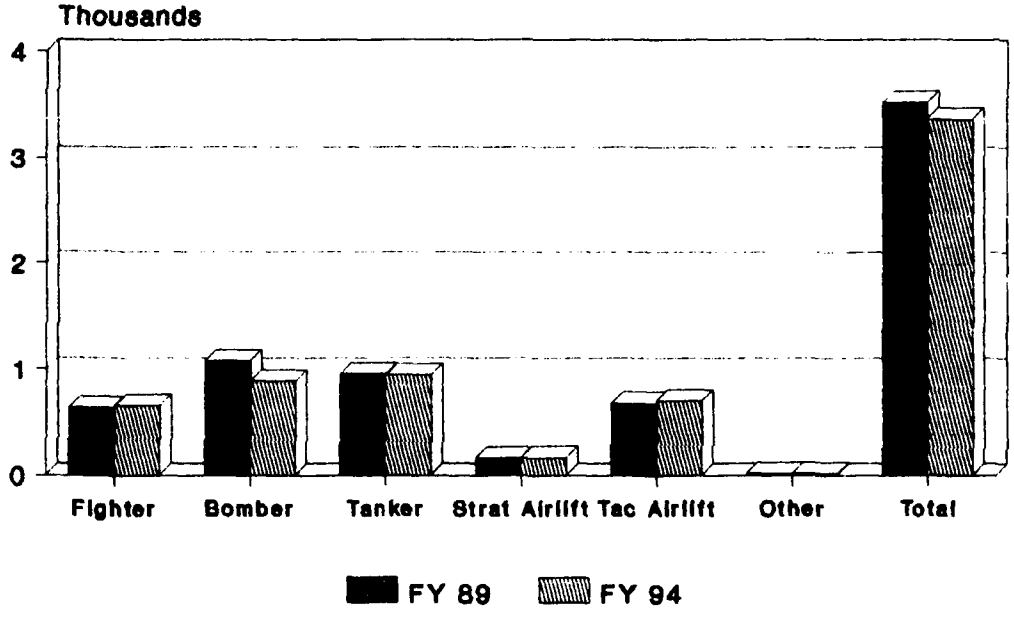

Chart 3-2

supporting this statement this report will explore two areas: the distribution of navigators specializing in fighter aircraft at Specialized Undergraduate Navigator Training (SUNT) and anticipated force projections.

The number of navigators entering into fighter training through SUNT indicates a strong need for future navigators in fighters. Based on the 1989 Rated Management Document , the fighter distribution will increase 19 percent over the next five years. (31:q-8 through q-17)

FIGHTER NAVIGATOR-SUNT DISTRIBUTION

FY	89	90	91	92	93	FY 89-93 CHANGE
Basic	57	59	62	71	73	+ 28 %
EWO	47	47	48	51	51	+ 8 %
Total	104	106	110	122	124	+ 19 %

Figure 3-3 (See Also Chart 3-3)

A second measure of near term navigator requirements is the force requirements as projected in the 1989 RMD. Navigator requirements should increase by three percent over the next six years. (31:3-7, 3-8, 3-9)

NAVIGATOR FORCE REQUIREMENTS-FIGHTERS

FY	89	90	91	92	93	94	FY 89-94 CHANGE
FORCE	636	563	563	595	625	654	+ 3 %

Figure 3-4 (See Also Chart 3-4)

The reason for the increasing demand for navigators in fighters is the procurement of the modified F-15's, and

FIGHTER NAVIGATOR
SUNT DISTRIBUTION

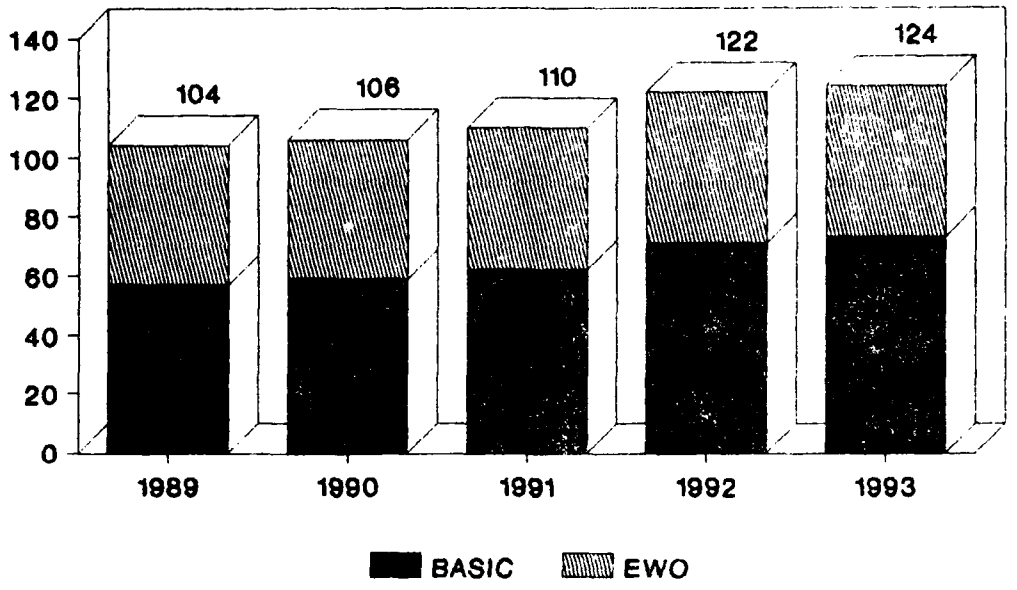

Chart 3-3

NAVIGATOR FORCE REQUIREMENTS
FIGHTERS

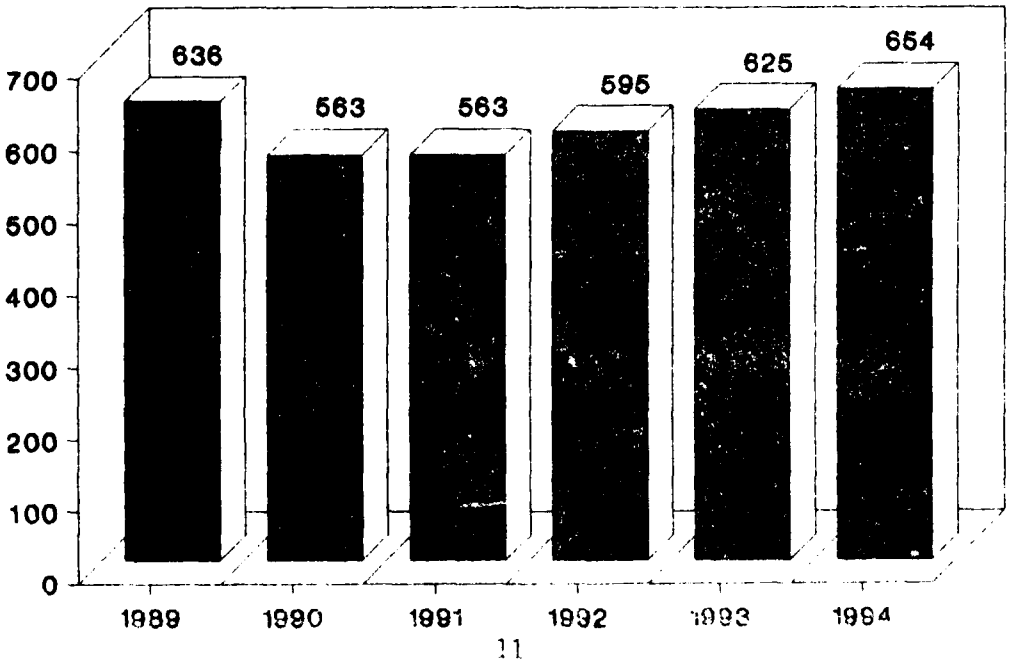

Chart 3-4

possibly the modified F-16, into a pilot/weapons system officer (WSO) crew.

F-15 Expanding Role

According to an article in The International Combat Arms, the F-15E Strike Eagle, originally a two-seat training model called the F-15D, was chosen as the new deep strike/interdiction fighter. But instead of the second seat holding a trainer, the back seat will "house" the weapon systems officer. The WSO (navigator) will monitor aircraft systems, weapon status and enemy activities. By using the WSO in this role, the F-15E will be dedicated to deep strikes against high-value enemy ground targets, while still retaining most of the air superiority of the earlier Eagles. Unfortunately, although prototypes have been very successful, budget cuts may force reductions in the projected procurement of 1,286 F-15 Eagles. Of these, 392 are scheduled to be F-15E Strike Eagles. (19:50-51)

In other developments, General Larry D. Welch, Air Force Chief of Staff, stated, "We need a follow-on aircraft to perform manned tactical reconnaissance and Wild Weasel missions." In response to this requirement another variation of the F-15 is also being considered. As a dedicated electronic warfare aircraft, the Wild Weasel F-15, could replace the F-4G currently in service and would complement the modified EF-111 force. As with the F-4G and EF-111, the F-15G's primary mission would be the detection.

jamming and destruction of enemy radar systems. (19:51) The use of the F-15 in the Wild Weasel role may use a navigator in this tactical and electronic reconnaissance role.

Even though the total buy of the F-15E may be reduced, delivery has recently begun. The 4th Tactical Fighter Wing (TFW) at Seymour Johnson, the first operational F-15E wing, was scheduled to receive its first aircraft in October 1988 and "to house" a full squadron by September 1989. (20:24) According to sources at the 4th TFW, the actual delivery date was delayed slightly with the unit receiving its first F-15E on 29 December 1988. The unit plans on receiving between 72 and 79 aircraft by the summer of 1991. (15)

F-16 Expanding Role

The F-16 *Fighting Falcon*, originally designed as a daylight air superiority fighter may also undergo modifications. The Air Force is considering a twin-seat aircraft based on the "D" version, possibly designated as the F-16G. The F-16G would be used as a multisensor reconnaissance aircraft to replace the RF 4C Phantom. An F-16G or RF-16G would be used in high-threat environments to obtain critical reconnaissance information. (19:84) This modification could also insure operational requirements for the navigator in todays generation aircraft. However, the next generation fighters appear to be a different story.

The Next Generation of Fighters

Although opportunities look encouraging for navigators

in todays generation fighters the future appears to delete that requirement. The Air Force is already well underway in planning for the future with the stealth fighter and the Advanced Technology Fighter (ATF). Neither aircraft are planning to use a navigator.

F-117A Stealth Fighter

The new stealth F-117A fighter, according to the Air Force Times , is a single seat aircraft. It appears the F-117A may also be used in multi-mission roles. Although it is designated as a fighter, it may be used to carry bombs or missiles for attack of ground targets. The Air Force plans to buy 59 F-117As by the end of 1990. (13:27-28) However, in any of these roles a navigators is not deemed necessary.

Advanced Technology Fighter

An Advanced Technology Fighter is currently being planned as a possible replacement for the F-15. According to a September 1988 Journal of Defense and Diplomacy study, the prototypes are being developed. Lockheed is building the YF-22A, and Northrop is developing the YF-23A. A fly off of the prototypes will lead to a production contract for the winner in 1993. The first production aircraft will be completed in 1995. (9:17) There is an Air Force stated requirement for up to 750 of these fighters. (43:178) At this stage of development there is no intent to have the original version of the ATF with a navigator as part of the crew. However, based on the future success of

the navigator in the F-15E, there may develop a need for a second crewmember in the future.

Although there may be a near term increase in navigators in fighters, up from 45 percent of the total navigator force in 1985 to a projected 60 percent in 1994, this increase in more than offset by the reductions in navigators in bombers. (8:13)

Force Requirements for Bombers

According to a December 1988 article in the Air Force Times , the Strategic Air Command (SAC) is eliminating many of the navigator positions in SAC aircraft. (17:4) A significant part of this reduction is in the bomber force. This reduction although not immediately visible in the SUNT is reflected in the RMD requirement projection for bomber navigators.

Despite the projected reduction in navigator requirements in bombers, the initial SUNT distribution for navigators entering into the bomber specialty actually increases by 14 percent from 1988 through 1993. (31:q-8 thru q-17)

BOMBER NAVIGATOR-SUNT DISTRIBUTION

FY	89	90	91	92	93	FY 89-93
BASIC	116	120	125	130	130	+ 12 %
EWO	60	60	70	70	70	+ 16 %
TOTAL	176	180	195	200	200	+ 14 %

Figure 3-5 (See Also Chart 3-5)

BOMBER NAVIGATOR
SUNT DISTRIBUTION

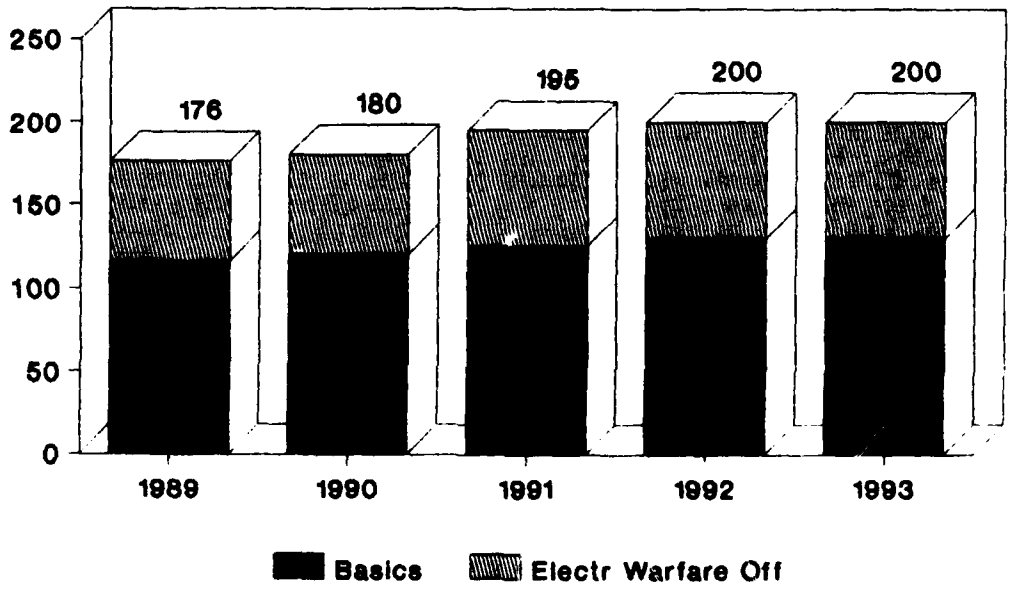

Chart 3-5

According to Lt Col Lee Stone, HQ USAF/XOOTW, the increase is only momentary due to a large number of SAC navigators that will be retiring or otherwise leaving the inventory over the next five years. Thereafter the SUNT rate will drop for bombers. (36)

The navigator distribution, based on the 1989 Rated Management Document for bombers, reflects the move toward fewer navigator requirements. Consequently, the total force requirements for FY 89 through FY 94 drops by almost 18 percent. (31:3-7, 3-8, 3-9)

NAVIGATOR FORCE REQUIREMENTS-BOMBERS

FY	89	90	91	92	93	94	CHANGE
FORCE	1078	982	925	928	915	888	- 18 %

Figure 3-6 (See Also Chart 3-6)

The future role of the navigator in bombers will eventually shift from the FB-111 and B-52 into the B-1 and possibly, though not probably, into the B-2.

FB-111

The two seat FB-111 will remain operational throughout the 1990s. Over the next decade it will have several modifications, including avionics to enhance navigation, attack, and terrain following capabilities. These modifications will ensure its continued use of the navigator in its nuclear mission and in its dual role capability with conventional weapons. (43:176) However, after the 1990's,

NAVIGATOR FORCE REQUIREMENTS
BOMBERS

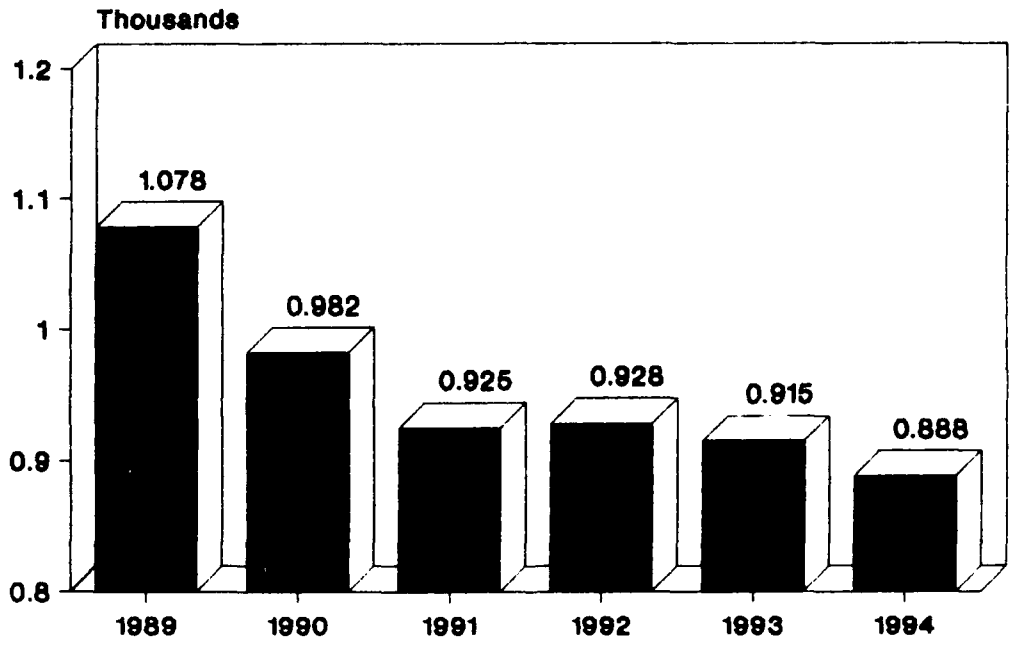

Chart 3-6

the aircraft may be eliminated.

B-52

Although the Strategic Air Command is undergoing a radical change, the Air Force is not planning to retire any more of its remaining 263 B-52s until most of the B-1Bs and at least some of the B-2 stealth bombers are operational. (43:175-176) The B-52 currently uses three navigators in the role as Electronic Warfare Officer, Radar Navigator, and Navigator. However, the idea of eliminating two of these positions is at least being discussed at the Major Command level. (26)

B-1

The navigator will continue to play an important role in the B-1B with its two navigator requirement as offensive and defensive operators. The 100 initial buy of the B-1B will continue to offer the navigator a unique challenge well into the next century.

Future Bombers

Although the navigator will continued to be employed in bombers with the current generation aircraft, they will probably be completely replaced in the next generation aircraft---the B-2 stealth bomber.

B-2 Bomber

The new B 2 Advanced Technology Bomber that virtually has the capability to hide in thin air will do so without the aid of a navigator. Although information on the highly

classified bomber is limited, the Air Force has reported that the B-2 will have a crew of two to operate its highly automated control systems. Although the aircraft has a two man crew, it also has space for a third crew member, if needed. (16:16) However, according to HQ SAC, the crew will consist of two pilots with no plan to use the third seat based on the current mission and threat. The aircraft commander, who will sit in the right seat, may be required to be one of the 816 Air Force navigators turned pilot. (26) Is there any chance that a navigator could be used in the B-2? The following scenario poses an interesting situation.

Automation versus Navigation

Is there a chance that the high cost of the B-2 could result in the temporary use of a navigator to reduce expenses? The B-2 bomber initial contract award was for 132 aircraft for $36.6 billion which equates to $277 million per aircraft. However, in May 1988, the Washington Post reported that the cost was up to $450 million. (9:17) Although the Air Force has not released its actual cost, it has agreed that the original $36.6 billion has been exceeded. (16:16) Although the cost ratio of the sophisticated electronics needed for the bombing system versus the cost of a navigator is classified, it poses a question. If it's less expensive to use a navigator instead of the electronics, could the high cost of the B-2 open up a navigator/bombardier seat? If so, and the chances are

remote, the situation would only be temporary.

A common characteristic between the large numbers of fighters, bombers and transporters is their increasing need for air refueling. With long range navigation being integrated into the KC-135 and KC-10 what are the opportunities for tanker navigators ?

Force Requirements for Tankers

At the time of this study there is a lot of discussion over the KC-135 navigators future. That discussion will eventually be resolved, but based on the 1989 Rated Management Document the tanker navigator training and requirements will continue at only a slightly reduced level.

Based on current information from the Air Staff, the SUNT distribution for tanker navigators remains almost even with a loss of only 3 slots over the next five years. (31:q-8 thru q-17)

TANKER NAVIGATOR-SUNT DISTRIBUTION

FY	89	90	91	92	93	FY 89-93
BASIC	126	121	121	121	121	- 4 %
EWO	25	27	27	27	27	+ 8
TOTAL	151	148	148	148	148	- 2 %

Figure 3-7 (See Also Chart 3-7)

TANKER NAVIGATOR
SUNT DISTRIBUTION

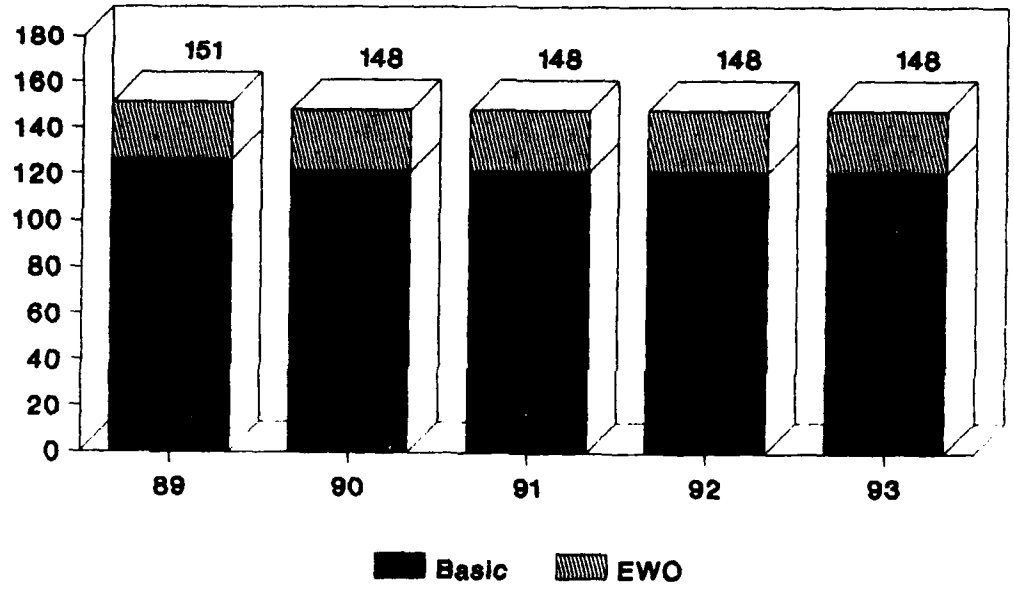

Chart 3-7

The future requirements for tanker navigators in the force similarly show a slight decline of about one percent. (31:3-7, 3-8, 3-9)

NAVIGATOR FORCE REQUIREMENTS-TANKERS

FY	89	90	91	92	93	94	FY 89-94
FORCE	951	931	930	933	935	940	- 1 %

Figure 3-8 (See Also Chart 3-8)

KC-135 & KC-10

The KC-135 and KC-10 will continue to provide tanker support well into the twenty first century. One of the latest modifications to the aging KC-135 is the Life Extension Structural Modification. This modification provides for renewal of the lower wing skin, enabling the aircraft to remain fully operational past the year 2020. (43:184) Although the KC-135 employs a navigator, HQ SAC is reviewing the possibility of eliminating the position. HQ SAC noted this change could eliminate up to 25-30 percent of all requirements for navigators in the command. (26) The KC-10, with its inertial navigation system has no navigator requirement and none is planned for the future.

The tanker provides airlift the capability of flying direct to almost any part of the world. As the Military Airlift Command (MAC) continues to increase its lift capability, the airlift navigator requirement will remain steady for the current generation of aircraft.

NAVIGATOR FORCE REQUIREMENT
TANKERS

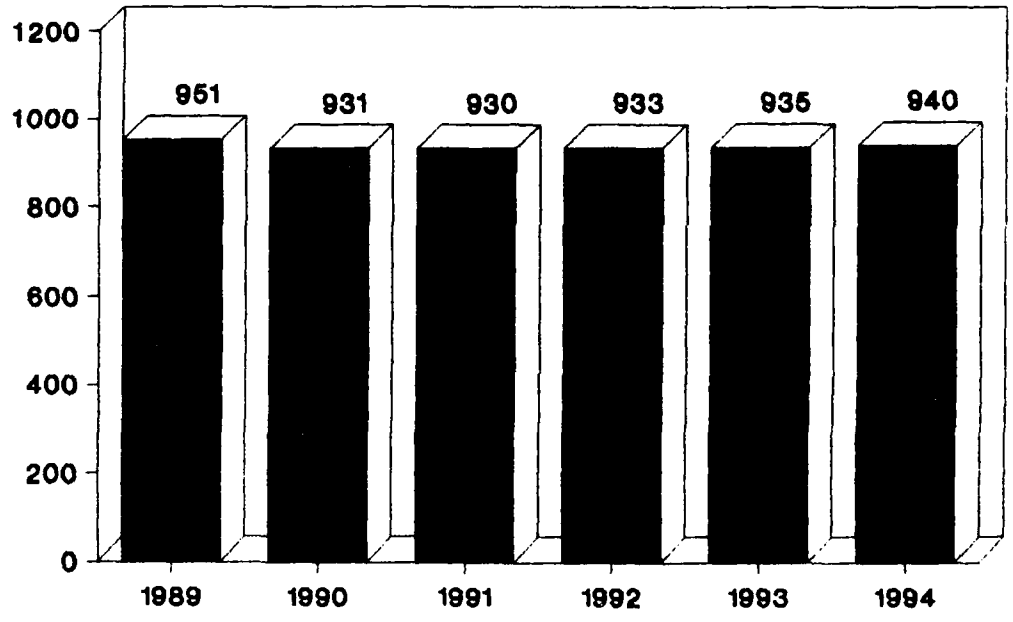

CHART 3-8

Force Requirement for Airlift

The requirements in both strategic and tactical airlift will remain essentially the same for the next few years but will decrease dramatically with the next generation aircraft. The INS equipped C-141B and C-5B no longer require a navigator for overwater missions. However, MAC still finds it advantageous to use a small navigator force for strategic Special Operations Low Level (SOLL) air drop missions. The C-130's, by and large, still retain the navigator as a primary crewmember. The navigator will continue to be used in the air drop, special operations, rescue, tanker, gunship, and overwater roles for the forseeable future. With new C-130's still being manufactured, this aircraft will be around well into the next century. (43:184)

The SUNT distribution for the next five years remains even for the strategic airlift (C-141 and C-5), and shows a slight overall increase for C-130 navigators, and a 60 percent increase in EWO navigators. (31:q-8 thru q-17)

STRATEGIC AND TACTICAL AIRLIFT-SUNT DISTRIBUTION

FY	89	90	91	92	93	CHANGE
STRATEGIC	17	17	17	17	17	0 %
TACTICAL						
BASIC	81	76	77	77	76	- 6 %
EWO	15	15	15	23	24	+ 60 %
TOTAL	96	91	92	100	100	+ 4 %

Figure 3-9 (See Also Chart 3-9)

STRATEGIC AND TACTICAL AIRLIFT
SUNT DISTRIBUTION

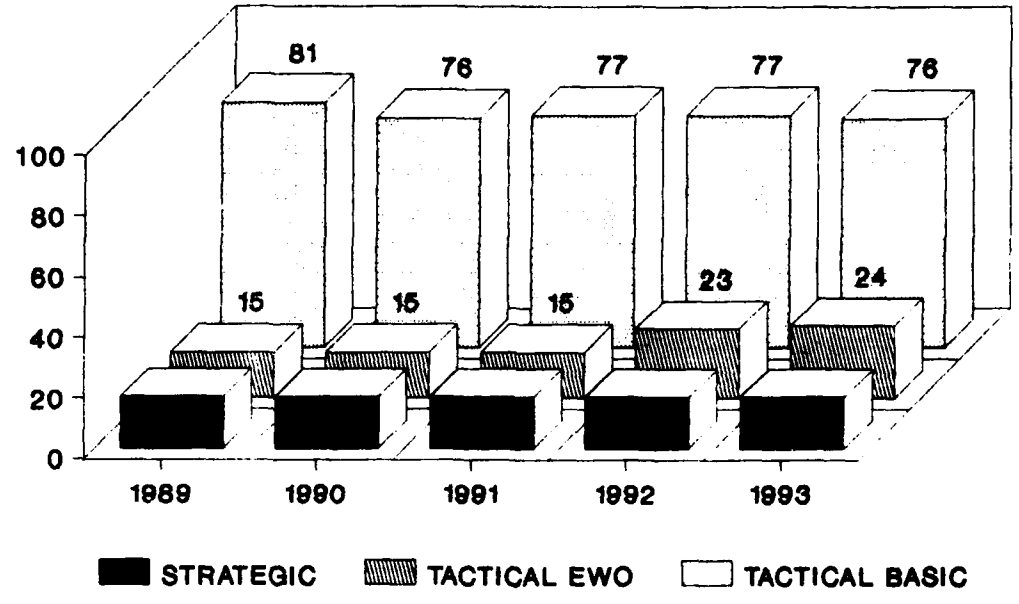

CHART 3-9

The force requirements for the next six years also reflect the fairly steady need for airlift navigators. (31:3-7, 3-8, 3-9)

NAVIGATOR FORCE REQUIREMENTS-STRATEGIC AND TACTICAL AIRLIFT

FY	89	90	91	92	93	94	CHANGE
STRATEGIC FORCE	158	162	162	162	162	162	+ 2 %
TACTICAL FORCE	678	666	693	697	703	703	+ 4 %

Figure 3-10 (See Also Chart 3-10)

Future Airlift

The future requirements for navigators in MAC varies between tactical and strategic aircraft.

AC-130

The Air Force is planning on increasing the number of AC-130's. This increase demonstrates a commitment by the Air Force to continue the use of navigators in the tactical role. Under the USAF's Gunship Replacement Program an additional eleven gunships will be added to the inventory. The new AC-130 "U" is currently being developed under a $155 million contract. With final delivery scheduled for 1993, the AC-130U will replace the AC-130A that will go into the reserves. (37:679)

C-17

According to the February issue of the Airlifter

NAVIGATOR FORCE REQUIREMENTS
STRATEGIC AND TACTICAL AIRLIFT

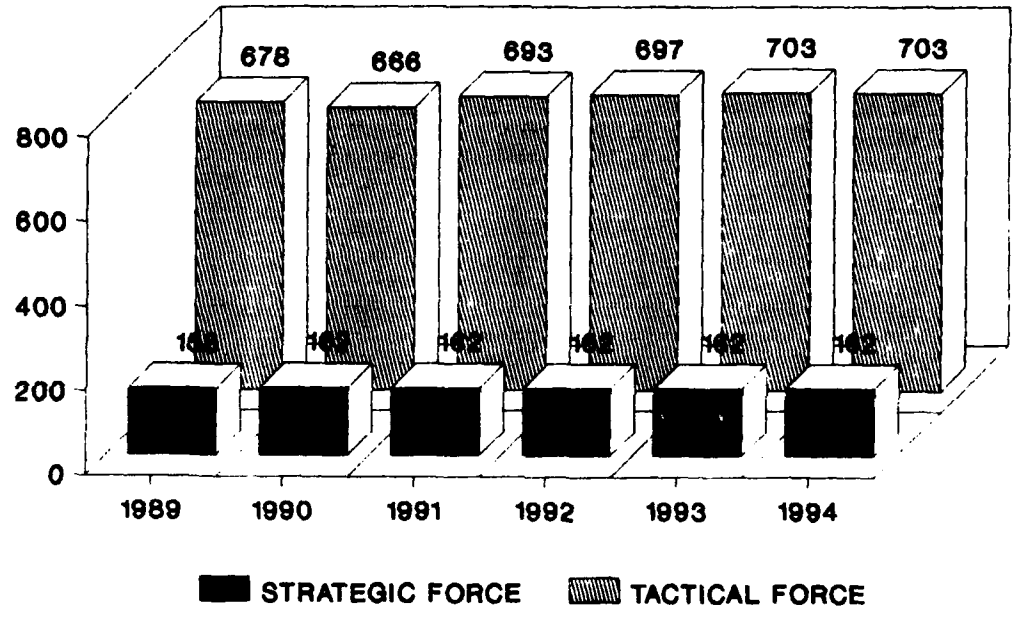

CHART 3-10

magazine, the C-17 is scheduled for its first flight in August 1990, with operational capability planned for September 1992. (2:6) Delivery of the planned buy of 210 C-17's would be completed by the year 2000. (43:182) The crew will consist of two pilots and a loadmaster. However, even in its airdrop role, there is no plan to use a navigator.

Space Shuttle

The newest opportunity, for a few select navigators, is in space. Within this decade of firsts, Colonel Richard M. Mullane became the first navigator to fly in space on August 30, 1984. Colonel Mullane flew as a mission support officer on the space shuttle mission SDS-41D onboard the Discovery. Colonel Mullane background is impressive but well within the reach of many of today's navigator force. He attended the United States Military Academy at West Point. He obtained a Bachelor of Science degree in Military Engineering, and a Masters degree from the Air Force Institute of Technology in Aeronautical Engineering, and has spent most of his time flying RF-4C's. According to Colonel Mullane, "There is a place in space for the navigator who is willing to put forth the effort. At NASA, it doesn't matter what kind of wings you wear. Their only concern is whether you can do the job." (28:5-10)

Summary

As evident, the navigator world is going through a

dramatic change. However, the opportunities are still very real and will continue to allow the navigator to fly in a variety of missions. However, as the current generation of aircraft slowly fade from the scene, so apparently will the need for the navigator. However, the current generation aircraft will be around for the duration of most careers of todays navigator and will provide them a challenging job well into the next century. Although flying is a basic part of the officers career, staff work is necessary to expand his horizons into effective management of resources, and leadership of people. The next section will deal with those opportunities of "flying a desk".

CHAPTER IV

STAFF OPPORTUNITIES

Although the 1989 Rated Management Document shows a decline in the number of staff positions available for navigators, it is this authors position that the actual opportunities to career broaden through a staff job above the wing will actually increase over the next five years. There are three driving factors: 1) the pilot shortage, 2) priorities in the rated supplement, and 3) the recent move to delay staff duties until field grade ranks.

The staff requirement for navigators shows a decline in most weapons system with an overall three percent reduction. (31:3-7, 3-8, 3-9)

STAFF POSITIONS FOR NAVIGATORS FY 89-94

FY	89	90	91	92	93	94	FY 89-94
FIGHTERS	827	821	810	809	807	807	- 2 %
BOMBERS	878	868	843	820	819	819	- 7 %
TANKER	344	338	338	338	338	338	- 2 %
STRAT A/L	151	150	150	150	150	150	0
TACT A/L	363	357	356	356	356	356	- 2 %
TRNR	29	29	29	29	29	29	0
UNSPEC	564	563	562	560	560	560	0
TOTAL	3156	3126	3088	3062	3059	3059	- 3 %

Figure 4-1 (See Also Chart 4-1)

Although the RMD shows a reduction of three percent for navigator staff positions, the pilot shortage may provide

STAFF POSITIONS FOR NAVIGATORS
FY 89- FY 94

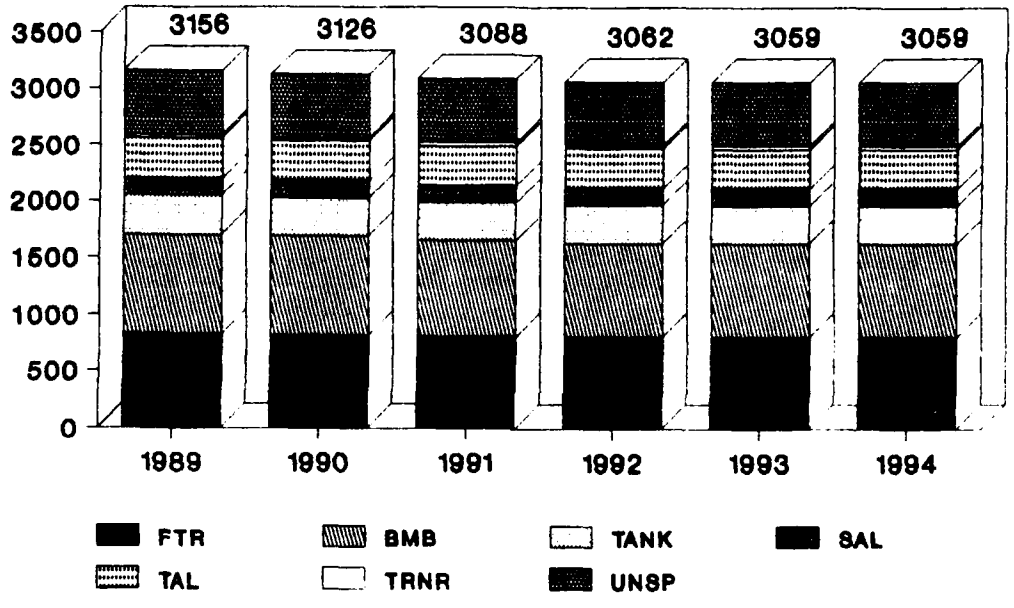

CHART 4-1

some staff opportunities.

Pilot Shortage

The priorities of the Air Force are, and should be, to fly. Therefore, the current pilot shortage may actually open up increased staff positions to the surplus of navigators that currently are being filled by pilots.

The pilot shortage is a serious Air Force problem. According to two Department of Defense reports on pilot retention published in the December 1988 Air Force Times , "Pilot retention has dropped from 72 percent in fiscal 1984 to 43 percent in fiscal 1988. The retention rate is likely to drop as low as 36 percent in fiscal 1991 if current trends continue. The service needs about a 63 percent rate to remain even." (17:4) Consequently, if the current trends continue, according to latest Air Force estimates, the service will be short by over 2500 pilots by FY 93.(31:O-1)

PILOT INVENTORY PROJECTIONS FY 88-93

FY	88	89	90	91	92	93
REQUIREMENTS	22699	22537	22193	22117	22070	22127
INVENTORY	22895	22312	21642	20767	20097	19575
DELTA	+196	-225	-551	-1350	-1973	-2552

Figure 4-2 (See Also Chart 4-2)

It is important to understand that this pilot shortage is different than the shortages in 1966 and 1978. In an article by RADM Peter H. Cressy, USN, in those years, pilot hiring approached 5,000 per year and pilot retention

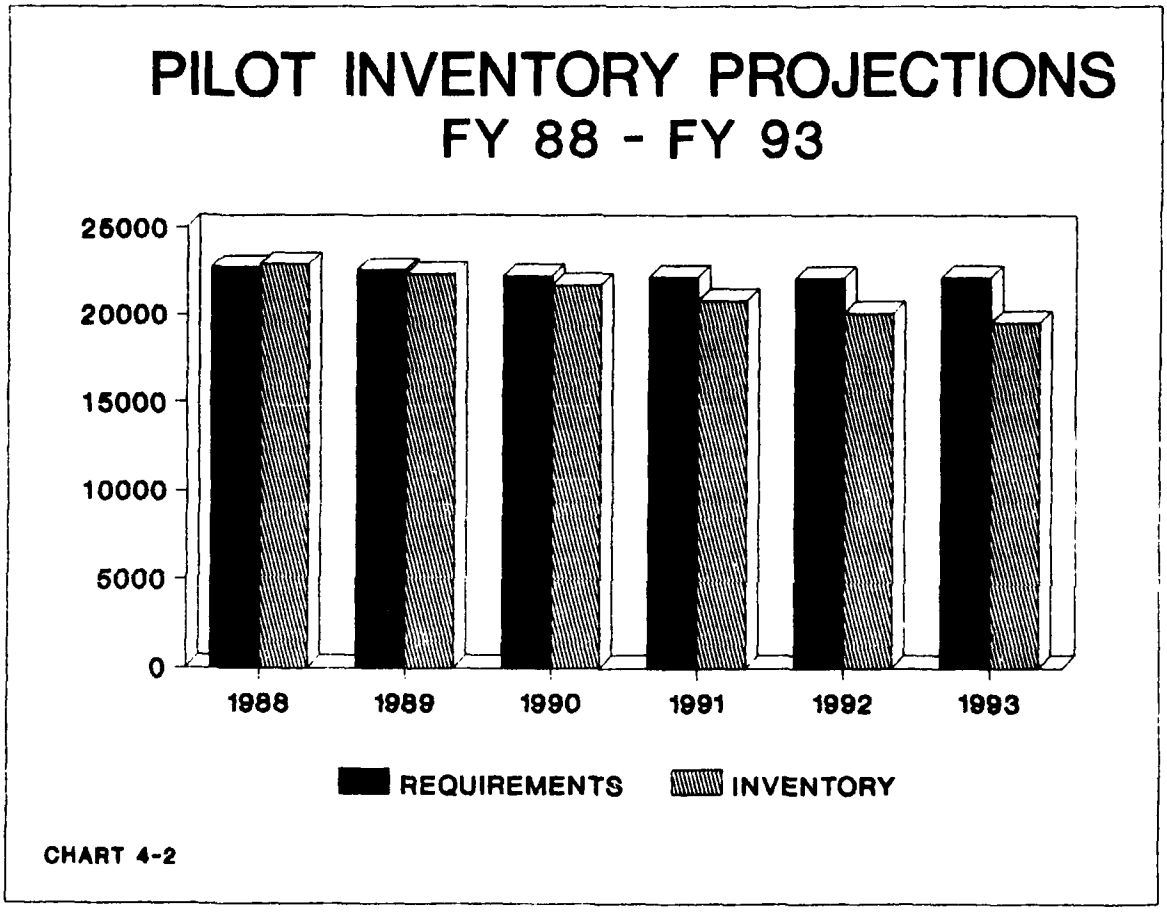
PILOT INVENTORY PROJECTIONS
FY 88 - FY 93
25000
20000
15000
10000
5000
0
1988
1989
1990
1991
1992
1993
REQUIREMENTS
INVENTORY

CHART 4-2

dropped. However, on either side of these hiring spikes, airline hiring averaged under 2,000 a year and there was often many furloughs of already hired pilots. This current hiring surge, however, is predicted to continue past the year 2007. There are three significant reasons for the difference between the current pilot shortage and those of 1966 and 1978. First, since 1985 deregulation has added many new flights and increased the numerical requirements for pilots. Two, airline hires have been increased by pilot retirements which have steadily climbed toward an annual rate of 2,000. Third, airline growth is being fueled by an aging civilian population that fly more, and air freight is experiencing a rapid growth. In a catch-22 situation, the pilot shortage has decreased the hiring standards while increasing salaries. These combine to entice even more military pilots to seek and to be hired into airline positions. (10:20) Understanding that the shortage many be around for an entire generation, this many have a significant effect on navigators in staff positions.

Opportunities in the Rated Staff

Even through the pilot inventory predicts a deficient of 2552 personnel, the staff requirements are only reduced by 100 during this same general time frame. (31:3-4, 3-5, 3-6)

PILOT STAFF POSITION

FY	89	90	91	92	93	94
STAFF REQUIREMENTS	5412	5358	5333	5313	5312	5312

Figure 4 3 (See Also Chart 4 3)

Should a significant portion of these staff positions remain, navigators may be required to fill those requiring rated expertise. With a long term shortage of military pilots for both flying and staff positions, changes must be made to shift the limited pilot resource to the highest priority. This issue was addressed at the September 1988 Air Force Rated Prioritization Conference. At the conference, General Larry D. Welch, requested the Air Force ensure pilots were not being used in positions that, by definition, did not require pilots. A subsequent review by all MAJCOMs, Special Operating Agencies, and the Air Staff was directed. (21:10-11) The results of this review have not yet been released. However, its obvious that many of the pilot staff positions may be changed. The question is--changed to what? It is possible that some of the pilot staff positions will be either deleted altogether, opened up to the new Air Operations Officer career field (19XX), combined with other pilot staff positions, or where rated expertise is absolutely necessary, changed to navigators

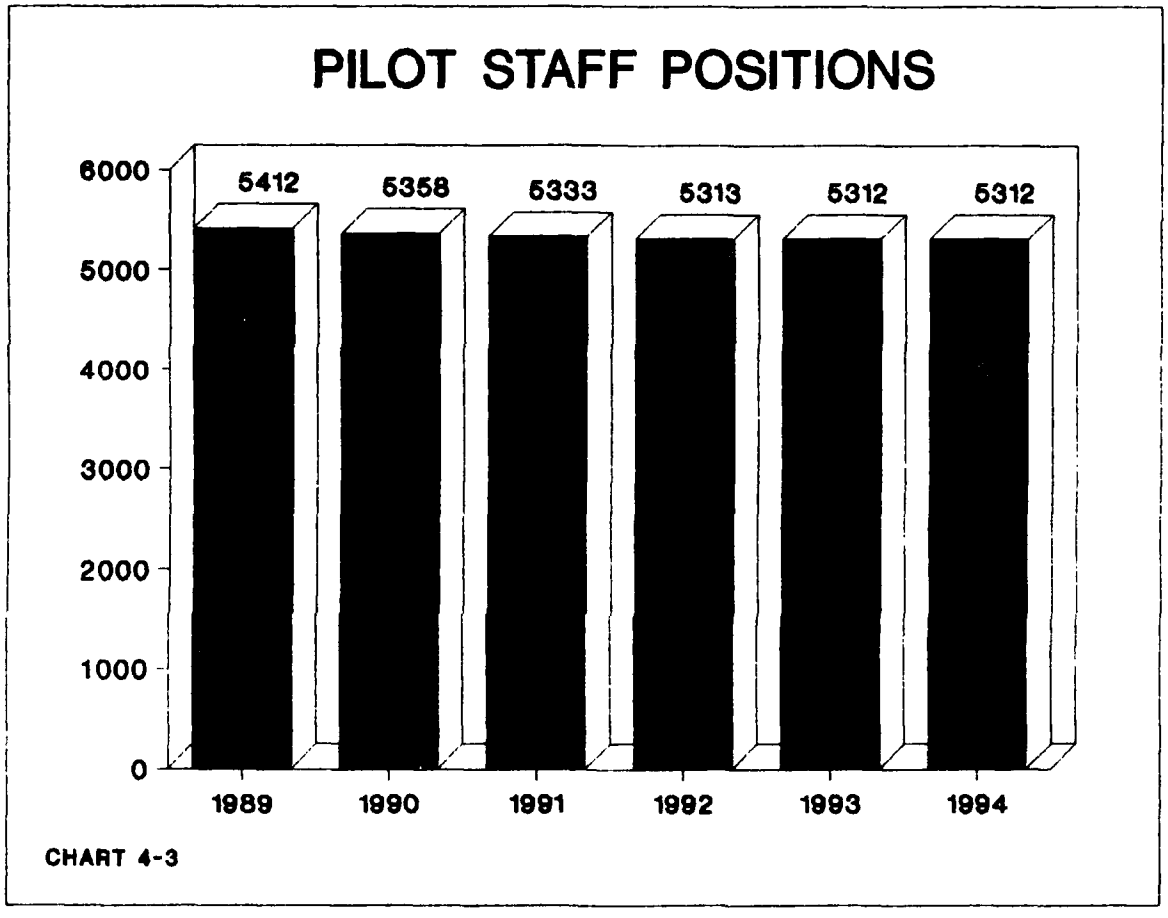
PILOT STAFF POSITIONS
6000
5000
4000
3000
2000
1000
0
5412
5358
5333
5313
5312
5312
1989
1990
1991
1992
1993
1994

CHART 4-3

positions. An interesting briefing at the September 1988 Rated Management Conference explored one solution. HQ/TAC proposed using navigators in prioritized pilot positions. The briefing proposed using weapon system specific navigators in specific pilot positions. The briefing suggested that in some positions the weapons system experience is more important than the aeronautical rating. The recommendation was to establish an annual option for a major weapons system (MWS) with a pilot specific staff shortfall to assign up to 50 same MWS navigators to its vacant pilot positions each year. (31:1-4, r-1) An update with AF/XOOTW indicates that this proposal, as written, would probably not be adopted for this next year. (37) However, with the surplus of navigators, at least until 1993, the navigator will be readily available to fill these staff positions. Realistically, a combination of all the previously mentioned alternatives may be used. This would indicate that at least some additional staff positions will be opened up to navigators.

The staff positions listed above are jobs that require, by Air Force Specialty Codes (AFSC), pilots or navigators. Many staff positions, however, are filled by non-rated officers. These positions are sometimes supplemented by rated officers and are referred to as rated supplement positions. Duties available in the rated supplement for navigators could increase the navigators staff opportunities

if the supplement continues.

Opportunities in the Rated Supplement

Due to the excess of navigators and the shortage of pilots, an increased percentage of navigators may be placed in the rated supplement. Before getting into justifying the introductory sentence, a definition of what constitutes the rated supplement is necessary. According to the 1987 Rated Management Document the Rated Supplement is an opportunity "...for rated officers to serve in nonrated career fields." Staff positions , for rated officers are defined as " Supervisory and/or overhead positions... excluding flying squadron commanders and operations officers..." that must be filled by rated officers. (30:3-4) The rated supplement are, therefore, positions normally designated for support officers (maintenance, personnel, logistics, security police, transportation etc.) that a pilot or navigator enters as a career broadening opportunity.

By using the same logic as in the staff positions, more navigators should be entering the rated supplement because the number of pilots is declining. However, according to AF/XOOTW, there is a possibility that the rated supplement may be completely deleted or at least significantly reduced. (36) This action would be a significant change since both the 1979 and 1986 Air Force Rated Supplement Review Boards delineated a clear need for rated officers in some

disciplines outside of operations. (30:5-2) As late as December 1988, HQ MAC concurred that "MAC supports a rated presence in maintenance, transportation, and other similar core support disciplines". However, under General Welch's guidance, due to the projected deficits in the rated force, a thorough review and drawdown of the rated supplement was considered necessary. (21:10-11) The March 1986 Rated Supplement Review Board established the number of valid positions in the rated supplement at 2880 and maintained that two-thirds of these should be filled by pilots and one-third by navigators. The board also prioritized these positions as either priority one or two for use should there be a need to drawdown the supplement to meet other rated requirements. (30:5-2) We have now reached that point. The Air Staff is currently reviewing the rated supplement requirement as requested by General Welch. The results of that board will have a significant effect on these career broadening opportunities. However, since there is a surplus of navigators until at least 1993, it would be in the best interest of the Air Force to use this surplus rated expertise in support areas. This would maintain an operational perspective in the support career fields.

Although the "combined" number of pilot and navigator rated supplement and staff opportunities will probably decrease, the recent move to delay staff duties until solid operational expertise is achieved in the cockpit may

actually benefit the navigator.

Delayed Staff Duties

Delayed staff duties may actually increase navigators opportunity for staff positions. An attachment to a letter from General Welch states, "Company grade officers best serve the Air Force and their own professional development by increasing the depth of their professional competence in their individual career areas." (39:4) For rated officers this means staying in the cockpit through the company ranks. This may actually increase navigators broadening his presence in staff duties.

The logic for this contention is as follows. First, 100 per cent of both pilots and navigators are available up to the six to eight year point in their career because of their initial obligation. Second, from the six year to the eleven year point pilot retention is projected to drop from 72 per cent in 1984 to only 43 percent in fiscal 1988. At the same time the navigator retention was 75 percent in fiscal 1984 and 71 percent in 1988. Third, since the promotion time to field grade ranks fall shortly after the initial commitment, there will be a higher percentage of navigators still available to fill those field grade staff jobs. Ergo, as long as the retainability of navigators remain higher than that of pilots, more major and lieutenant colonel navigators will be available to fill the remaining staff positions.

The increased opportunity to acquire staff experience, and rated supplement support positions, may lead to increased opportunities in command positions as well. In the next section I'll explore those opportunities.

CHAPTER V

OPPORTUNITIES FOR COMMAND

Navigator command opportunities are available, especially in support squadrons. These opportunities should continue, and slightly increase, in both operational and support areas in the future. This statement is based on three assumptions: 1) current trends toward navigator commanders continue, 2) staff positions increase making the navigator more competitive for all commander positions and, 3) the rated supplement opportunities increase providing experience necessary to successfully compete for support commander positions.

Navigator Command Positions

Before an officer is selected to command a squadron there should be some opportunity for that officer to make use of that experience to command at the senior officer level. It is therefore important to look at where navigators command at the wing level and above.

Senior Command Opportunities for Navigators

Senior navigators (colonel and above) are selected for command throughout the Air Force, especially in support areas. There are 351 general officers in the Air Force, according to the USAF/DPG document dated 1 October 1988. (1) Of these 351 generals, 13 are master navigators according to

their bibliographies. (5) The list that follows is a sample of those 13 navigators in positions of senior leadership, i.e. above squadron level. The list establishes the wide area in which senior navigators have held command.

Air University (AU)

Brigadier General (MGen Select) David C. Reed. Senior commands include: Commandant, Air Command and Staff College; and Commander, 485th Tactical Missile Wing in United States Air Forces in Europe (USAFE). As a special note, General Reed was the first navigator in the Air Force to command an operational tactical flying squadron -the 91st Tactical Reconnaissance Squadron at Bergstrom.

Air Force Systems Command (AFSC)

General Bernard P. Randolf. Senior commands include: Commander, Air Force Systems Command. General Randolf is the only four-star navigator in the Air Force.

Air Force Logistics Command (AFLC)

Major General William P. Bowden. Senior commands include: Commander, Oklahoma City Air Logistics Center.

Air Training Command (ATC)

Lieutenant General Carl R. Smith. Senior commands include: Commander, Air Force Military Training Center.

Major General William J. Porter. Senior commands include: Commander, Officer Training School; and Commander, U.S. Air Force Recruiting Service.

Major General Larry N. Tibbetts. Senior commands include: Commander, Air Force Military Training Center; and Commander, Lowry Technical Training Center.

Military Airlift Command (MAC)

Brigadier General (select) Charles C. Barnhill Jr. Senior commands include: Commander, 314 Tactical Airlift Wing.

Strategic Air Command (SAC) and Space Command

Major General Ralph E. Spraker. Senior commands

include: Commander, 321st Strategic Missile Wing; and Commander, 1st Space Wing.

Tactical Air Command (TAC)

Brigadier General Larry L. Henry. Senior Commands include: Commander, 831st Air Division; and Commander, 37th Tactical Fighter Wing.

Since operational and support command opportunities do exist at the senior officer levels, command positions at the squadron level should be available to train and evaluate these future senior commanders. A review of squadron commanders reveals that squadron commands for navigators reflects that greater opportunities lie in support commands over operational.

Squadron Commands for Navigators

Command opportunities for navigators at the squadron level lie in primarily the support area with an occasional operational command. Therefore, the best opportunities for navigators to command in the future is to broaden their support background so they are qualified not only for operational commands but support commands.

A wide variety of command positions are filled by navigators. HQ MAC provided an "Analysis of Opportunity to Command" memo, dated 9 November 1988. In the analysis, the percentage of the 18-20 year group of all officers who have ever command is presented. Just over 12 percent of navigators in that year group had ever held command. The results are as follows: (40:1)

OFFICERS HAVING COMMAND 18-20 YEAR GROUP

RATING	SAMPLE GROUP	PERCENT HAVING HAD COMMAND
PILOT	657	27.2
NAVIGATOR	143	12.6
NON-RATED LINE	210	74.3

Figure 5-1 (See Also Chart 5-1)

The question now is--what type of command. A snapshot of squadron commanders provides that answer. The following information was provided by the personnel offices of HQ MAC, HQ SAC, and HQ TAC. It is current only for the day that the information was gathered, hence the term "snapshot". For the purpose of this study, operational command is defined as the commander being on flying status.

OFFICERS HAVING COMMAND
18 - 20 YEAR GROUP

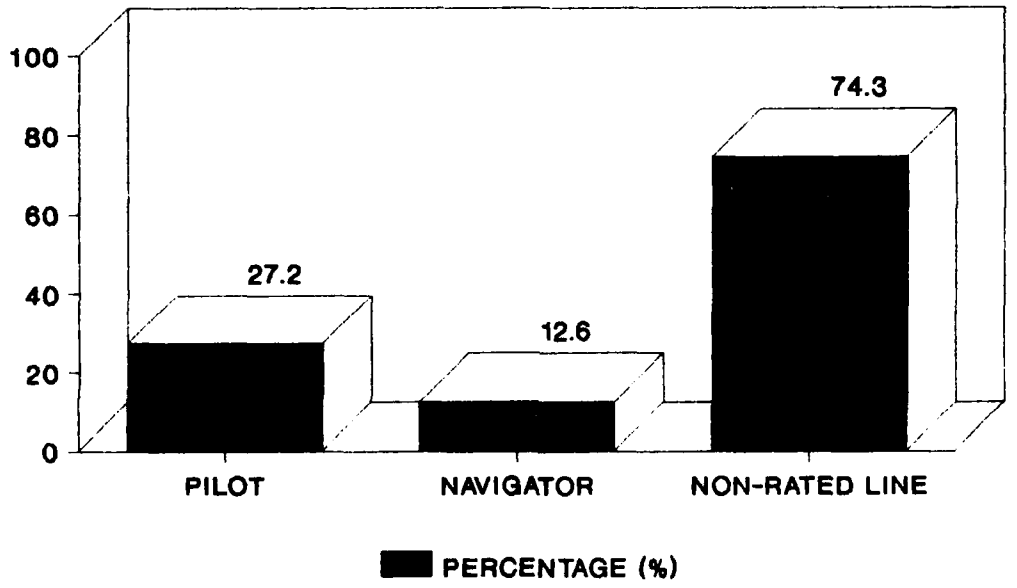

CHART 5-1

SNAPSHOT OF MAC SQUADRON COMMANDERS (11)

TYPE OF SQUADRON	NAV/CC	PILOT/CC	SUPPORT/CC
OPERATIONAL			
Weather Reconnaissance Sq	1	1	
Tac Airlift Training Sq	1		
* Det 1 89 MAW	1		
** Aeromedical Airlift Sq		3	
Aerospace Rescue & Recovery Sq		6	
** Flying Training Sq (Helo)		2	
** Helicopter Sq		1	
Military Airlift Sq		26	
Operational Support Sq		4	
Special Operations Sq		9	
Tactical Airlift Sq		13	
Technical Training Sq		3	
TOTAL	3	68	
SUPPORT SQUADRONS	NAV/CC	PILOT/CC	SUPPORT/CC
Aerial Port Sq	2	5	7
Audiovisual Sq	1		1
Civil Engineer Sq	1		1
Combat Support	2		
Mobile Aerial Port Sq	2	3	2
Maintenance Sq	8	24	24
Supply Sq	1	1	8
Services Sq	2	7	4
Transportation Sq	2	8	5
Security Police Sq		3	13
Weather Sq			10
Other		7	14
TOTAL	21	59	88

* DET 1 is a Volant Eagle (SQ/CC) position.
** Navigators are not crewmembers of this squadron.

Figure 5-2

Operational commands for navigators is limited. However, navigators have been commanders of strategic and tactical squadrons. The snapshot of SAC confirms that support squadrons provide increased opportunities for command.

SNAPSHOT OF SAC SQUADRON COMMANDERS (25)

TYPE OF SQUADRON	NAV/CC	PILOT/CC	SUPPORT/CC
OPERATIONAL			
B-52 Squadrons	1	15	
KC-135 Squadrons	1	32	
RC-135 Squadrons	1	2	
SR-71 Squadron	1	0	
B1-B Squadrons		6	
FB-111 Squadrons		5	
EC-135 Squadrons		2	
E-4 Squadron		1	
* KC-10 Squadrons		6	
* TR-1/U-2 Squadrons		3	
TOTAL	4	72	
SUPPORT SQUADRON			
Maintenance (Aircraft)	18	31	29
Maintenance (Missile)			12
Missile			20
Munitions	3	1	15
Security Police	3	4	17
Services	1	4	19
Supply		1	21
Transportation	4	5	15
TOTAL	29	46	148

* Navigators are not crewmembers of the squadron

Figure 5-3

Again, although operational command positions are few for the navigators, support squadon commands, especially in maintenance, are routinely filled by navigators.

Although the Tactical Air Command has no operational navigator commanders, as of this time, they also provide support command positions.

SNAPSHOT OF THE TACTICAL AIR COMMAND (3)

Within the Tactical Air Command (TAC), a snapshot of squadron commander as of March 1989, yielded zero navigators as commanders of operational squadrons. TAC squadron commanders are as follows: (3)

TYPE OF SQUADRON	NAV/CC	PILOT/CC	SUPPORT/CC
OPERATIONAL		All	
SUPPORT			
Air Operations	5	4	4
Maintenance	9	10	54
Security Police		2	19
Supply		2	12
Transportation			15
Services			17
Civil Engineer			12
Air Weapons Control			14
Mission Support			20
Manpower			14
Training			2
Electronic/Comm			1
Other			18
TOTAL	14	18	202

Figure 5-4

As should be apparent, the opportunity for command of an operational squadron is small. Navigators should continue to increase their value as operational commanders, but to increase their opportunities for command, they should

broaden support knowledge. Specifically, areas such as maintenance, supply, transportation, services, and security police provide dramatic increases for command. Once a rated officer completes a rated supplement tour, are command opportunities increased? The next section will answer that question.

Command Opportunities in Support Squadrons

The rated officer that has experience in a support area increases his chances for command. According to a study by HQ/MAC, of 6292 pilots and navigators in the 18-20 year group, only 19.4 percent had ever held a commander position. In contrast, over 74 percent of career support officers in the same year group have commanded. (40:1) By completing a support tour, the rated officer then competes not only for operational squadrons, but at a higher level for support squadrons. The priority to fill support commander position varies by command. At HQ MAC the priorities are set as follows: first choice, a career support officer; second choice, a rated officer with a bona fide AFSC in that career area; third choice, a rated officer. The career support officer has an excellent chance of command. By being the second group in line for a support command billet, the rated officer also increases his chances for command if he has that bona fide support background. The following table,

provided by HQ MAC, clearly demonstrates that most career support officers command in the 18-20 year group have commanded at least once. Of special note is that at least 70 percent of the officers in weather, aircraft maintenance (ACFT MX), transportation (TRANS), services, supply, administration (ADMIN), and security police (SP) have commanded. (40:atch 2)

MAC OFFICER OPPORTUNITY TO COMMAND
SELECTED CAREER FIELDS

CAREER FIELD	AFSC	18-20 YR GROUP SIZE	PERCENT EVER IN CMD
OPERATIONAL	10XX-12XX 22XX,003X,006X	6292	19.4
SUPPORT SQUADRONS			
WEATHER	25XX	108	86.1
ACFT MX	40XX	44	88.8
TRANS	60XX	26	80.8
SERVICES	62XX	8	100.0
SUPPLY	60XX	10	70.0
ADMIN	70XX	8	87.5
SP	81XX	7	100.0
OPS SUPPORT	19XX	2	0
AUDIO VIS	23XX	9	100.0
SCIENCE	26X-28XX	3	0
INFO SYSTEM	49XX	3	0
CIVIL ENG	55XX	15	33.3
CONTRACTING	65XX	4	0
LOG PLANS	66XX	4	25.0
FINANCE	67XX/005X	2	0
PERSONNEL	73XX/001X	12	25.0
MANPOWER	74XX	1	100.0
ED & TRNG	75XX	1	0
PA	79XX	3	0
INTEL	80XX	1	0
LEGAL	88XX	8	12.5
CHAPLIN	89XX	7	0
HEALTH SVS	90XX	7	0
BIOMED SVS	91XX	19	1.7
PHYSICIAN	93XX	35	14.3
NURSE	97XX	32	3.1
DENTAL	98XX	12	0

Figure 5.5

It should be clear that the rated officer, pilot or navigator, should get experience in one of these support areas. Although he will not compete as well as the career support officer, his chances for command are dramatically enhanced. Once the officer has successfully competed for either command or staff, or both, then opportunity for promotion would logically increase.

CHAPTER VI

OPPORTUNITIES FOR PROMOTION

The opportunities for promotion will increase if the staff and command opportunities develop as have been outlined in previous chapters. Simply, if the promotion rates for pilots and navigators are roughly equivalent early in their careers, then differences at the senior levels are at least partially based on staff and command experience. Then, as these areas open up to more navigators, there should be an increased promotion rate. This chapter will explore promotion rates for captain, major, lieutenant colonel and colonel. It will then explore the theory that promotion shifts from company grades to field grades are partially due to staff and command experience. The chapter will then go a step further to discuss performance demands, and common myths about promotions.

Promotion History

First, promotion rates between pilots and navigators are roughly equivalent through major. This table is for officers in the promotion zone (PZ) for the first time. (23)

PROMOTION TO CAPTAIN (ROUNDED TO NEAREST PER CENT)

BOARD	OVERALL	PILOT	NAVIGATOR	SUPPORT	MISSION SUPPORT
88A	96	99	99	99	94
88B	96	99	98	95	94
87B	97	99	99	96	94
87A	96	99	99	97	94
86B	96	99	99	94	
86A	95	99	99	93	
85B	95	98	97	92	
85A	92	97	97	89	
AVERAGE	95.4	98.6	98.4	94.4	94.0

Figure 6-1 (See Also Chart 6-1 thru 6-4)

PROMOTION TO MAJOR (ROUNDED TO NEAREST PERCENT)

BOARD	OVERALL	PILOT	NAVIGATOR	SUPPORT	MISSION SUPPORT
88	83	96	92	83	77
87	82	93	88	79	77
86B	81	89	85	75	
86A	80	88	85	73	
85	79	82	81	83	
84	78	82	79	76	
83	77	79	75	77	
82	76	79	78	74	
AVERAGE	79.5	86.0	82.9	77.5	77.0

Figure 6-2 (See Also Chart 6-1 thru 6-4)

The previous promotion rates show only about a four percent difference between pilots and navigators. Furthermore, support officer promotions trail rated promotions. However, for promotion to lieutenant colonel and colonel, differences between pilots and navigators increases by a factor of almost three (four percent as compared to 11 to 13 percent). Additionally, support officer promotions rapidly increase above navigator rates.

PROMOTIONS TO LIEUTENANT COLONEL (ROUNDED TO NEAR PERCENT)

BOARD	OVERALL	PILOT	NAVIGATOR	SUPPORT	MISSION SUPPORT
88	NO BOARD WAS HELD IN 1988				
87	62	67	57	65	61
86	62	64	58	62	
85	61	67	55	62	
84	62	66	54	57	
83	60	65	55	57	
82	65	71	56	63	
AVERAGE	62.0	66.7	55.8	61.0	61.0

Figure 6-3 (See Also Chart 6-1 thru 6-4)

PROMOTIONS TO COLONEL (ROUNDED TO NEAREST PERCENTAGE)

FY	OVERALL	PILOT	NAVIGATOR	SUPPORT	MISSION SUPPORT
87	44	51	40	40	39
86	43	49	29	42	
85	44	44	32	45	
84	44	46	31	41	
83	43	49	41	43	
AVERAGE	43.6	47.8	34.6	42.2	39.0

Figure 6-4 (See Also Chart 6-1 thru 6-4)

Admittedly, there can be numerous reasons for the significantly lower promotion rates for navigators. These reasons include PME completion, OER indorsements, job performance--the list is endless. However, it is at the field grade ranks that the officer normally moves out of his professional speciality and into staff and command assignments. It is therefore reasonable to assume that staff and command positions do increase the officers potential for promotion. If the premise of this paper holds, i.e. that a pilot shortage will increase navigator

CAPTAIN TO COLONEL PROMOTIONS
PERCENT PROMOTED IN ZONE (IPZ)

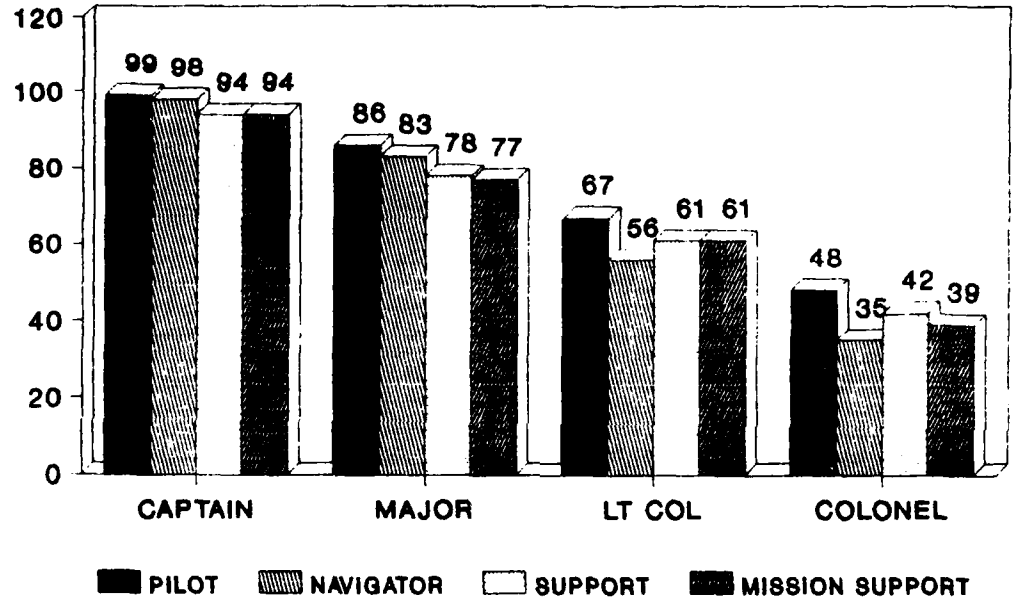

CHART 6-1 THRU 6-4

staff and command positions, then navigators should see an increase in promotions to the field grade ranks.

Opportunities are necessary to excel, however, they are only half of the process. Regardless of the opportunities, the individual drive for excellence is paramount if the navigator career field is to move ahead. The following section includes some words of advice of what is necessary to bring opportunity and capability together.

Opportunities vs Performance

Opportunities exist but determination, and performance must be achieved and maintained if the officer is going to take advantage of those opportunities. Almost without exception the key words for success seem to be "Excel in your current job!" This subsection will offer different pieces of advice from a few who have excelled. Officers noting these statements may increase their promotability. (Note: Rank is taken from the time of the comment)

Lt Gen Bernard P. Randolph--"'Seek leadership roles. You are first and foremost an Air Force officer. Navigator, pilot, engineer, etc. are skill areas only.'" (41:8)

Maj Gen Larry N. Tibbetts--"' Look for the hard things to do.'" (41:8)

BGen C. Norman Wood - "Don't get locked into a narrow field of experience. Go for Job diversity." "Get your gates early. This is probably the hardest point to make to the young navigator and have him really believe it." (41:8)

BGen William J. Porter "' Don't ever believe you're second best. So much of what people are able to accomplish in life is predicted on attitude. Be positive. '" (29:3)

BGen Donald C. Metz "'Best things to do is concentrate

on the job they [young officers] currently have. Don't jockey for position.'" (41:8)

BGen Reed--It's a very competitive Air Force, you've got to "earn your spurs." (32)

Although the above may be good words for getting ahead, there are some common myths discouraging some excellent people from continuing to strive for those "stars".

Secondary Zone Promotions and Command Myths

A couple of common myths are that one cannot make general without secondary zone promotion(s) and command is a must. Wrong! A study completed in 1985 by now MGen Wood of 18 general officer navigators indicated that only 18 percent have had one secondary promotion, 18 percent had two, 4 percent had three. Of the remaining 54 percent, more than half of the survey group had no promotions in the secondary zone. In fact, one of those was deferred once to major. Additionally, only half have had a command. General Wood concludes that command is a little more important than the others assignments, but it is not necessary for promotion to the star rank. The path to promotion is an unidentifiable combination of promotions, command, high level staff positions, and timing. (41:6-8)

Throughout this study I've highlight facts and trends about promotion, command, and staff opportunities. Now, "What's it all mean?"

CHAPTER VIII

CONCLUSION

The future of the Air Force navigator is directly dependent on:

1. Pilot manning,
2. Rated supplement,
3. Staff positions, and
4. Technological advancement of the next generation aircraft.

Pilot Manning

If the pilot manning crises continues as projected then the rated expertise needed in command and staff positions will be supplemented by navigators. This will thrust the navigator into an increased role at all levels of the command and control structure. In addition, recent proposals to increase gate times will accentuate the staff shortage problem. This demand will provide increased staff opportunities for the navigator. Should the pilot bonus work, lessening but not eliminating the shortage, there will still be an increased need for navigators.

Rated Supplement

The opportunity to participate in the rated supplement is of major importance to the navigator. The rated supplement provides the navigator, and pilot, a desired creditability in order to command a support squadron.

Eliminating the rated supplement, however, does not negate the fact that there will still be a shortage of career support officers to fill all the commanders billets. The principle impact of a cut in the rated supplement would be that the rated officer would not have been groomed as well to understand the support mission complexities.

Staff Positions

There are significant opportunities for navigators to enter into staff positions. Twenty-four percent of the pilot requirements are for staff as compared to an impressive 35 percent for navigators in 1993. (31:3-6, 3-8) Add the pilot shortage, and by default, the navigator will be in even greater demand to fill positions that require a rated expertise.

Technology of the Next Generation Aircraft

Of course the most important ingredient for the future of the navigator is a demand for them in an aircraft. Based on the present movement toward the next generation aircraft, the navigator force will be reduced as the current generation aircraft are replaced. Twenty to thirty years from now, the C-17, the B-2, the F-22 or F-23 and similar aircraft will be the norm. The navigator will slowly be replaced by spaced based satellites, the ring laser gyro inertial navigation system, or other scientific developments. However, a full career is still attainable

for the current navigator force. Additionally, should budget reductions in defense increase, these programs could be delayed, providing longevity for the navigator.

PROPOSALS

Based on the conclusion that the navigator requirement will be around for the next 20 to 30 years, some important initiatives are necessary. These initiatives are necessary to insure the navigator is provided the opportunity for a full and challenging career. These proposals include dual AFSC's, establishing a career monitor, and growth of the rated supplement.

Dual qualify staff AFSC's. The pilot shortage is real. It will continue for the foreseeable future. Now is the time to made a fundamental change in AFSC designation. A complete review is indeed timely to identify those rated staff positions that require a rated expertise but are not dependent on pilot or navigator technical skills. The staff supervisor should be able to chose a staff officer based on mission requirements, and the projected officers ability to perform staff functions. Therefore, current and future staff positions should be dual coded now to allow time for this significant change.

Navigator career monitor. The 10,000 navigators on active duty today will be disappearing in the next 30 years. However, there does not appear to be an office responsible

for the transitions. I would recommend an AF Manpower Personnel Office (AFMPC) that would be held responsible for compiling statistics, and informing major commands (MAJCOMs) of their findings. Most importantly, this office would be held responsible to provide navigators the education needed to transition into an alternate career or to find new careers, possibly in the space.

Rated supplement explosion. I recommend rated supplement programs similar to the highly successful "Volant Wrench" program. In this program, a pilot or navigator, earn an entry level AFSC in maintenance (40XX), while maintaining some aircrew currency. These officers are then experienced in both support and operation areas and become highly desirable for command positions in either mission area. A "Volant Cop", for security police, a "Volant Store" for supply, or a "Volant Van" for transportation would be a highly desirable program to enhance career development and retainability.

SUMMARY

When I began the research for this paper I was fully prepared to unequivocally say there was no future for the navigator. That the new navigator will never be able to complete a full 20 or 30 year career in his chosen field. Furthermore, that the military personnel system had an obligation to begin a study of how and when they were going

to start a transition program to retrain almost 10,000 officers into other AFSC's over the next few years. What I found surprised me. Yes, the celestial navigator is going away as new navigation systems come on line in the next generation aircraft. However, for this generation of aircraft, the job is going to be even more challenging, fast moving, and navigators will be in the decision making process with the pilot in a combat environment.

I was fortunate enough to interview BGen Reed, commandant of Air Command and Staff College (ACSC) at Maxwell AFB, the day the two-star list came out and he was on it. General Reed, a navigator brought up in the fighter world, provides a unique perspective. He said he was surprised at how little the computers were fully integrated into the demands of the cockpit. Twenty years ago he thought we would be much further along today. Secondly, when technology progresses to the point where it can fully integrate the multiple duties the navigator is filling the the speeds of the new fighters and bombers, and at a cost that is permissible, then we will need to not only look at the need for the navigator, but of a pilot. (32)

The future of the Air Force navigator is undergoing many changes. However, his aviation knowledge will be necessary for several more decades, and by then space may open up yet unknown opportunities. Being the "nav" will continue to be a dynamite career field.

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